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Minutes of the Technology Leaders Workshop

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Canada

1997 TECHNOLOGY LEADERS WORKSHOP

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1997 TECHNOLOGY LEADERS WORKSHOP

Executive Summary

Background

Over the past two years significant changes in the program delivery and the technology investment strategies for the Defence Research and Development Branch (DRDB) have been undertaken, and additional major changes are underway. These changes affect all levels of the Branch, particularly the Section Heads, Thrust Leaders and Thrust Coordinators who must implement the changes and provide technology leadership at the working level to ensure a successful transition to the new modus operandi.

During June 1997, Associate Chief, Research and Development, visited the five Defence Research Establishments to conduct a communication and feedback session on the progress/success in implementing the changes. The feedback indicated that the thrust leaders, section heads, and thrust coordinators would welcome the opportunity to provide input to the numerous initiatives which are on-going, as well as recommend solutions to issues which have arisen as a result of the changes already implemented. Throughout the discussions, nine issues were identified as requiring further action. The feedback sessions also indicated that a well-focussed workshop bringing together all of the technology leaders at the Section Head level would be an excellent method to consolidate the discussions and recommendations, and would provide an appropriate forum to produce an action plan to implement improvements.

As a result this workshop was planned. The nine issues identified through the visits to the DREs were further consolidated into six issues through a poll of attendees. Attendees were then placed in working groups based on their preferences for participation. Finally, briefings by Chief, Research and Development (CRAD) and a representative from the Technology Assessment Working Group (TAWG) were scheduled to provide updates on the new role of the Branch within the Department of National Defence, and on the Technology Investment Strategy which forms one of the key elements of the way ahead for the Branch.

Objective of Workshop

The objective of the workshop was to provide an opportunity for the Technology Leaders of the Branch at the middle management level to discuss issues which affect the ability of the Branch to achieve its vision, and to develop an action plan for implementing improvements.

Discussion

At the beginning of the workshop, Dr. Leggat (CRAD) outlined his vision for the Branch and the role of the attendees in achieving that vision. Mr. Marwood (Acting DG/DREO)

then outlined progress of the TAWG in developing the Technology Investment Strategy. Following these briefings, the attendees were split into working groups covering six issues:

1. Investing in Forward Looking Technology
2. Defining the Roles of Thrust Leaders, Section Heads and Thrust Coordinators
3. Leveraging Resources and Attracting New Funding
4. Managing Information
5. Serving the Client Better
6. Implementing a Business Development Program

Following deliberations, preliminary recommendations were presented to CRAD and Associate CRAD, who asked the working groups to come up with an action plan to implement the most urgent of the recommendations. The preliminary presentations indicated a number of commonalities from working groups 2 and 5, and working groups 3 and 6. Therefore, these groups were asked to combine their recommendations and action plans for the final presentations.

Recommendations

Working Group 1. Investing in Forward Looking Technology

Action	Who	When
Establish a protected technology investment fund which represents 5-10% of the Branch resources (both funding and personnel).	RDEC	immediate
Sell the client at the Overview Group and Working Group level on the need for a forward looking strategy and the technology investment fund	Thrust Leaders/ DSAs	This planning cycle
Establish tight sets of criteria and procedures for submitting and reviewing technology investment fund proposals. Ensure technically expert reviews of submissions	Technology Assessment Working Group	immediate
Increase the amount of forward looking R&D within the thrusts	Thrust Leaders	this cycle

Acquire the freedom to attract, train, and retain the needed personnel - Draft a position paper for CRAD - Meet with Senior Management (ADM level) of other S&T departments & organizations to compare policies and determine ways to improve situation - Examine ASD solutions	 DS PoI CRAD ASD team	 Dec 97 immediate immediate
Review and prioritise infrastructure (facility and equipment) requirements associated with the technology investment strategy	DGs, Section Heads	this year
Survey internal and external sources of infrastructure funding and make recommendations on best approaches to obtaining the necessary funds	DRMPC	this year

Working Groups 2 and 5. Defining the Roles of Thrust Leader, Section Head and Thrust Coordinator and Serving the Client Better.

Action	Who	When
Simplify thrust business plans and reports. Report to client only at project level. Show finances/resources at work unit level only when necessary to allocate resources to individual DREs. This will reduce the workload on Section Heads and clients.	Thrust Leaders, DSAs, SAs	this planning cycle
Rationalize the number of thrusts. Align them where possible with client requirements so that there is one thrust per military office of prime interest (OPI). This will save Branch resources and reduce client overhead	Thrust Leaders, DSAs, SAs	next Overview Group meetings
Pursue client sponsors/partners for long term R&D activities by expanding Thrust Advisory Group and Overview Group memberships.	Thrust Leaders/ Coordinator	immediate

Working Groups 3 and 6. Leveraging Resources and Attracting New Funding and Implementing a Business Development Program

Action	Who	When
Update the current status of revenue generation in each of the labs and the mechanisms being used	SectionHeads BDOs	immediate

Confirm CRAD authority to retain and roll over revenue generated through contracting in, specified purpose accounts and licensing arrangements for our intellectual property	DGRDCA, CBDO	next few months
Define the amount and types of revenue generation projects which should be pursued - provide interim guidelines until permanent ones are developed	CBDO	soon
Complete handbook on revenue generation and distribute	DGRDCA	soon

Working Group 4: Managing Information

Action	Who	When
Ensure that financial officers in the DREs gain access to DWAN and all Section Heads are connected to BANYAN	DRDIM DRE IT	Mar 98
Build an improved and integrated program planning and management tool (either COTS or web-based)	DRDIM	Sept 98
Enforce branch standards for all office application software such as word processing, presentation and spreadsheet applications	CRAD	Soon
Develop policies for collecting and maintaining records from official e-mail messages. Maintain awareness and implement electronic data and records management system (EDRMS) as soon as available. Interim individual policies should be implemented by DREs	DRDIM DREs	medium soon
Investigate ways to make better use of latest information sharing technologies, including internet, intranet between labs, and extranet with external partners to maintain security while streamlining information transfer	all	short to medium
Explore use of internally developed information tools for addressing the need to capture and manage the full benefits of R&D activities	DRDIM	medium
Address internet security concerns (perhaps through ENTRUST adoption)	DREs	soon

Systemic Issues

A number of systemic issues which require high level resolution were also identified. These include the lack of consistency between the formulation and delivery strategies and the performance review and reward mechanisms for DSs. There were also discussions concerning the need for empowerment (signing authority, etc.) at lower levels to reduce the workload on Section Heads.

In the information management forum, corporate buy-in to information sharing versus protection was seen as a systemic issue, as was the need to emphasize interoperability by using common office software versus allowing everyone to have their own favourite software.

In the area of revenue generation and business development all agreed that the Branch must have control of its own intellectual property and be granted the flexibility to introduce some novel business practices to attract funding/partners. The CF clients must also accept the need for the Branch to undertake a revenue generation effort, and the Department must also be willing to allow the Branch to manage its own revenue.

General Observations, Feedback and Unresolved Issues

As well as the specific recommendations outlined above, the workshop produced a number of additional benefits, some general observations and feedback, and identified a number of unresolved issues.

1. Benefits:

The workshop provided an excellent opportunity for all of the DRDB Technology Leaders to become acquainted with one another, share experiences, and help each other address individual and common problems. Among the major benefits of the workshop was the opportunity for the new CRAD to introduce himself to all of his Technology Leaders at one location and express his view of the way ahead for the Branch. This, along with the results of the workshop discussions, helped to define and gain acceptance for a common vision which the Technology Leaders will be able to work toward. The workshop was a good team building exercise.

2. General Observations:

A survey was conducted at the end of the workshop to determine the level of satisfaction of attendees with the presentations, discussions, and outcomes of the workshop. The participants were generally pleased with the issues and outcomes of the working groups, and felt that the workshop was informative and worthwhile.

3. Unresolved Issues:

During the question periods and in the working groups a number of important issues were identified which were not adequately addressed in the direct discussion topics. These issues could form the basis of future workshops or could be discussed at other meetings of opportunity.

A key issue which was identified as a continuing problem is the lack of communication among the DREs, and between the DREs and the Branch headquarters. The result is a continued lack of trust and cooperation. A prime example which was highlighted was the instance of a major development project which was initiated in headquarters without the knowledge of the appropriate Thrust Leader in the DRE. Addressing this issue is critical in building a better team attitude within the Branch and avoiding duplication of effort.

Although the participants were unanimous in their agreement that the Technology Investment Strategy is basically sound, many highlighted the need for a clearer description of the roles of the Technology Assessment Working Group, the process of creating the Strategy, and the process for creating and managing the Technology Investment Fund. The Group should produce and distribute a summary of its progress so far, defining the roles, mandate and process to all middle managers so that they can better understand where the Group "fits" within the new Branch mandate.

A final issue which was discussed by a number of the working groups was the roles and locations of the Scientific Advisors, the Deputy Scientific Advisors, the Thrust Leaders and the Thrust Coordinators. Many felt that the jobs could be consolidated at Headquarters to provide easier access to the clients and reduce the amount of work at the Section Head level in the DREs. However, an equal or greater number believed that the separation of the formulation of the program from the delivery would adversely affect cohesion of the program and would reduce the access of the Section Heads to the client. Lack of trust, communication and teamwork are also contributors to this issue.

Conclusion

In conclusion the workshop was considered to be a valuable exercise by attendees. A number of issues were addressed, concrete recommendations were made, and an action plan to complete them was initiated. In particular, the technology investment strategy, the business development effort, and the issue of overworked Section Heads will benefit from completion of the recommended actions.

1997 TECHNOLOGY LEADERS WORKSHOP

A. Background

Over the past two years significant changes in the program delivery and the technology investment strategies for the Defence Research and Development Branch (DRDB) have been undertaken, and additional major changes are underway. A major change that has already been implemented is the adoption of the thrust approach to program delivery, which provides transparency of the program so that the Canadian forces client can more easily influence, appreciate and support the Branch efforts. The focus of the R&D program on client requirements has been to the detriment of the longer term research that is vital to the continued high value of the Branch to the Department. In response, a Technology Investment Strategy has been initiated to address the long term defence science and technology requirements of the Canadian Forces and suggest a forward looking R&D program for the Branch.

At the same time, government mandated reductions in Defence spending have forced the Branch to reduce its operating costs and ensure that it is delivering the R&D program in the most efficient manner possible. As a result, the Branch has undertaken a number of business transformation initiatives to maximize the efficiency of program delivery, explore other delivery options, and determine ways to generate revenue to offset budget cutbacks. Most of these initiatives are on-going.

These changes affect all levels of the Branch, particularly the Section Heads, Thrust Leaders and Thrust Coordinators who must implement the changes and provide technology leadership at the working level to ensure a successful transition to the new modus operandi. For example, the thrust approach has focussed much of the program formulation and delivery activities on the Section Heads, who are often double-hatted as Thrust Leaders. This extra responsible has raised a number of issues in addition to the most obvious one of creating overworked Section Heads. In addition, the Technology Investment Strategy and the Business Transformation Strategy are having major effects on program delivery mechanisms used by Section Heads.

Prior to this workshop there had been limited feedback from the Section Heads, Thrust Leaders, and Thrust Coordinators on the success of the strategies, the effects of the budget cutbacks, and the proposed way forward for the Branch. Therefore, during June 1997, Associate Chief, Research and Development, visited the five Defence Research Establishments to conduct a communication and feedback session on the progress and success in implementing the changes. The feedback indicated that the thrust leaders, section heads, and thrust coordinators would welcome the opportunity to provide input to the numerous initiatives which are on-going, as well as recommend solutions to issues which have arisen as a result of the changes already implemented. Throughout the discussions, nine issues were identified as requiring further action. The feedback sessions also indicated that a well-focussed workshop bringing together all of the technology leaders at the Section Head level would be an excellent method to

consolidate the discussions and recommendations, and would provide an appropriate forum to produce an action plan to implement improvements.

As a result this workshop was planned. The nine issues identified through the visits to the DREs were further consolidated into six issues through a poll of attendees. Attendees were then placed in working groups based on their preferences for participation. Finally, briefings by Chief, Research and Development (CRAD) and a representative from the Technology Assessment Working Group (TAWG) were scheduled to provide updates on the new role of the Branch within the Department of National Defence, and on the Technology Investment Strategy which forms one of the key elements of the way ahead for the Branch.

B. Objective of Workshop

The objective of the workshop was to provide an opportunity for the Technology Leaders of the Branch at the middle management level to discuss issues which affect the ability of the Branch to achieve its vision, and to develop an action plan for implementing improvements.

The agenda consisted of overview briefings by CRAD and a representative of the Technology Assessment Working Group followed by working group discussions on particular topics. The overview briefings provided a framework for the working group discussions by defining the way ahead for the Branch and updating the participants on the Technology Investment Strategy. The working groups provided an opportunity for the participants to carry on in-depth discussions on the six issues which they selected as most important. The participants were then asked to provide achievable recommendations for action at the working level and develop an action plan to implement them in a relatively short time frame. A copy of the agenda for the meeting is attached as Annex A.

C. Overview Briefings

1. CRAD Perspective on Renewal (DRDB: R&D Beyond 2000)

Dr. Leggat (CRAD) addressed the attendees at the workshop to provide them with a vision for the future of the Branch and a framework for achieving that vision. The vision for the Branch is "As the national defence science and technology agency, provide leadership to the Canadian Forces and the Canadian Defence industrial base into and through the next century". This will be achieved by conducting a focussed R&D program which is forward looking, by providing support to the CF and industrial partners on S&T issues, and by influencing the defence strategic planning process.

Dr. Leggat also discussed the large number of changes in the program delivery strategy over the past few years. He highlighted a number of achievements including the success of the thrust approach in focussing the program on client requirements and the first R&D Advisory Council meeting, where he gained support for the Branch way

ahead. The appointment of Scientific Advisors and Thrust Leaders, as well as the implementation of Overview Groups are seen as important steps in ensuring visibility of the program to the CF client and in gaining their support.

He described a number of on-going initiatives including the Business Transformation Strategy designed to increase our visibility in the Department, demonstrate forward-looking technology leadership, implement more effective business practices, and study alternate service delivery mechanisms which will help us to achieve our goals. He described a number of new practices which are being explored to help us to become more "businesslike" in order to attract revenue, increase our leveraging capability, and improve the efficiency of delivery of the R&D program. In this discussion, he highlighted the importance of the alternate service delivery options in shaping the future of the Branch.

Next, he addressed the government mandated program reductions and the Branch plan to meet them. He noted that the Branch reductions mirror Departmental and ADM Mat losses. He also highlighted that the Branch had been granted a single operating budget to allow greater flexibility in addressing the reductions, and mentioned the importance of revenue generation and leveraging as ways to offset funding shortfalls. He highlighted personnel rejuvenation and renewal as a high priority to ensure the continued currency of the scientific workforce.

Dr. Leggat then outlined his five point strategy to build on past strengths. These include a commitment to customer focus and profile, maintenance of a motivated workforce, continued development of a highly networked R&D function, implementation of flexibility for revenue generation and management, and continued demonstration of technology leadership.

Having outlined the direction the Branch will take, Dr. Leggat then emphasized the importance of the technology leaders in achieving success. He noted that they are important in helping to build more effective strategies through participation in workshops such as the present one where feedback and recommendations on key issues are being solicited. He also stressed that they must provide the leadership necessary to implement the strategies at the working level.

Finally, he related the importance of the working groups and the need for achievable recommendations and an action plan which can be implemented at the Section Head level without the need for higher level approval.

A copy of Dr. Leggat's overhead transparencies is contained in Annex B.

2. Technology Investment Strategy

Mr. Gordon Marwood (ADG/DREO) provided a brief to the workshop participants on the progress of the Technology Assessment Working Group (TAWG) in developing a Technology Investment Strategy for the Branch. A copy of his briefing slides is

contained in Annex C.

Dr. Marwood began his brief by defining the mandate of the TAWG, which is to recommend and manage a technology investment portfolio for the Branch by identifying forward looking defence technology needs, defining a R&D program to meet those needs, reporting on the progress of implementing the program, and managing the Technology Investment Fund which supports the portfolio. The goal is to produce a Technology Investment Strategy which will allow the Branch to undertake a forward looking R&D program in technology areas which are relevant to an agreed set of military operational scenarios defined through consultation with strategic planners within the Department.

The TAWG was formed by RDEC in late 1996 to build a Technology Investment Strategy for the Branch. A number of workshops in specific technology areas were held to identify those which should be pursued in a forward looking strategy. The TAWG then reviewed the technology competencies within the Branch and rationalized them against the critical defence technologies for the future to determine the changes in the resource and personnel allocations required to optimize the Branch technology competency for the year 2010.

The Technology Investment Strategy was then developed to provide an implementation process to achieve the required changes in the R&D program. The TAWG has considered a number of technology coordination concepts including consolidation to concentrate expertise in one facility, a lead lab concept where one lab is responsible for maintaining expertise although the expertise might be posted to other facilities as required, and the hub concept where the expertise is disperse but is coordinated by a hub leader through regular meetings. The TAWG then recommended that each of the ten critical defence technology competencies should adopt either consolidation, the lead lab concept or the hub concept. They also determined that the ten technology competencies could be grouped into three science and technology clusters: human systems, combat systems, and sensors and information technology.

The TAWG then considered what kind of an organization is needed to coordinate and manage the new technology areas. The criteria they used included reducing workload, clarifying roles in formulation and delivery, integrating business management, sustaining client services, accommodating technical leadership, and defining a distinct role for headquarters, all while limiting internal organizational changes which would require relocating significant numbers of employees. They have produced an interim organizational model which is still being discussed at this time.

Recently, the TAWG has recommended the formation of a technology investment committee chaired by CRAD, and composed of the Chief Scientists, the Director-General of Business Management, and the Director of Strategic Policy. The committee would be responsible for managing the technology investment fund, completing technology forecasting, coordinating the technology clusters, maintaining the scientific human resources strategy, evaluating the national/international technology

collaborations, and up-dating the technology investment strategy when necessary.

D. Working Group Discussions

The large number of changes that the Branch has implemented to adapt to the new way ahead have caused a number of issues to arise at the Section Head level. Prior to the workshop, nine priority issues were identified through a consultation process that included visits to the DREs in June 1997 by Dr. Kimbell (Assoc. CRAD). These nine issues are the following:

1. Investing in forward looking technologies
2. achieving personnel renewal
3. defining the roles of Thrust Leaders, Section Heads and Thrust Coordinators
4. leveraging resources and attracting new funding
5. assessing program performance
6. managing information
7. serving the client better
8. reducing bureaucratic workload
9. implementing a business development program

Prior to the workshop the participants were asked to select in order of preference the three issues they would most like to discuss at the workshop. The list of nine issues was then pared down to the six preferred issues (underlined) based on the responses of the participants. Each participant was placed in their first or second choice of subject when a preference was stated. A leader was chosen for each working group, and three contractors were made available to help facilitate discussions. The Group Leaders were provided with a format for the working group discussions which included issue definition, assumptions, discussions, recommendations, and systemic problems. Group leaders were asked to focus the discussions on those aspects of the issue which would lead to recommendations that could be actioned quickly at the Section Head level, and to note those aspects which would require long term or higher level action. The following section contains a summary of the discussions and recommendations from each working group.

1. Working Group 1: Investing in Forward Looking Technology
(Dr. Ross Graham, DREA, Group Leader)

The working group identified a number of points as key in defining the issue. They felt that, as the leader in Defence S&T, the Branch must be able to address the short, medium and long term S&T requirements of the Department. They noted that the existing thrust management system is doing a good job in meeting short and medium term requirements, but there is a requirement for a forward-looking strategy to meet the long term needs. However, in order to succeed in this strategy we must manage all aspects of our investment, including contract dollars, personnel resources, capital equipment and infrastructure. We need a management process which is most

likely to ensure success, and we need to identify and select the appropriate areas for strategic investment.

The group also defined what constitutes a strategic investment in technology. They concluded that the areas may include high payoff research that is not handled by the normal thrust process because it has too high a risk or is broad enough that a specific sponsor cannot be identified. They also concluded that undertaking a strategic investment might require changes in both program (personnel and funds) and facilities.

Having determined that both a solid framework for managing the process and a means for identifying the strategic investment areas were needed, the group then discussed the existing Technology Investment Strategy and ways to improve it. In particular they focussed on the Technology Investment Fund, criteria to select projects and how to manage the process of providing funding for forward looking R&D. They concluded that the fund is extremely important for retaining in-house expertise, and should have a guaranteed funding level of 5 - 10% of contract funds and personnel resources. Further, the fund should not be subject to budget reductions; it should form an essential part of the program.

They also determined that client acceptance of the strategy and the fund was an important aspect to its success. They felt that, even though the Research and Development Advisory Council (RDAC) had accepted the concept, the Scientific Advisors and the Thrust Leaders must convince the clients through the Overview Groups and Working Groups that they should support our efforts to shift some of the focus of the R&D program toward longer term issues.

In terms of selection criteria for the fund, the group emphasized that it is important to have a well-defined set of criteria to use for soliciting and evaluating proposals for grants from the fund. They felt that the selection process should focus on technology development (defence relevance being understood), and that the funds should not be arbitrarily divided among client groups although long term balance between client groups should be preserved. They also stated that a corporate client (eg. TAWG) must be identified for this research so that it can be monitored and evaluated.

The group then addressed the question of how to select the technologies for investment by considering two options: a committee of sages or market forces. The committee of sages is a top down approach which would allow more radical changes in direction to be achieved. The most likely candidates to form such a committee are the TAWG members who could ensure that the link to defence technology is maintained through consultation with Department strategic planners. The market forces approach would likely yield better ideas because they would originate from the technology experts, but would require a well-defined set of criteria. This approach would also require a competitive, peer-reviewed process to ensure that the project funding is based on merit. The group agreed that strategic guidance should be provided to help define the types of proposals which are preferred, but that no proposals should be excluded.

Further, the best proposals should go ahead, regardless of subject. The group also felt that the investment strategy must be up-dated often to take into account rapid changes in technology trends.

The selection criteria for funding proposals should include the quality/scientific merit of the proposal, the innovation or novelty of the idea, the defence relevance, the fit with the overall technology investment strategy, and the potential for wealth generation. The proposals should include a detailed work plan which clearly identifies deliverables. The project should span no more than three years, cost no more than $1M, and contain at least 25% internal laboratory contribution. A risk assessment should be completed and technology retention should be addressed for each proposal. At the end of three years, the project may be submitted for renewal if it is still very promising and is not yet ready to be incorporated into the Thrust system.

The group also discussed some of the implications of undertaking a technology investment strategy on facilities/equipment and personnel. The need to maintain and upgrade facilities as a drawing card for industry partnerships was considered. The group concluded that the Branch should explore all sources of funding for facility up-grades including industry and the military. They stressed that a key to the success of any technology investment strategy is the ability to hire, train, and retain a highly qualified workforce, and that this requirement must be addressed at a high level by RDEC, Treasury Board, and the Alternate Service Delivery team. Career development of managers must include exchanges with industry or international partners, and extensive contacts with the military client, preferably at the operational level to ensure a broad level of relevant experience.

The group also provided some other general recommendations which will impact the technology investment strategy. These include the need to: increase our level of collaboration with our Allies in new activities; access other sources of funding such as Defence Applied Research Program Agency (DARPA); elicit support and greater input from strategic planners by having them visit the DREs; and, increase the level of forward looking R&D in all thrusts.

The group concluded that it is critical for the long term health of the Branch to invest strategically in forward-looking technology. They felt that a 5-10% investment of total contract dollars and personnel resources is a realistic target, and that no major changes to the existing thrust management system are required to implement the strategy.

A copy of Dr. Graham's presentation is contained in Annex D.

2. Working Group 2: Defining the Roles of Thrust Leader, Thrust Coordinator and Section Head (Dr. Greg Luoma, DRES, Group Leader)

In defining the issues, the group focussed on the roles of thrust leaders, thrust coordinators, and Section Heads. Most agreed that the Section Heads are overworked,

especially when they are double hatted as Thrust Leaders. They also agreed that there was a conflict of interest potential for Thrust Leaders/Section Heads, particularly when thrusts are split between the Thrust Leader's section and other sections. The split of duties between the Thrust Leader, Thrust Coordinator and Section Head is also an issue, particularly when major projects are initiated without knowledge or approval of the appropriate Thrust Leader. Finally, the misalignment of the thrust approach with the program delivery method and the rewards mechanisms for Defence Scientists was also highlighted as an issue.

In order to discuss the issues within a reasonable context, the group agreed to assume that the thrust system would remain largely unchanged, that the work being done by Section Heads was appropriate for their level, and that there was a general need to free up Section Head time for considering the longer term planning and technology investment issues being emphasized for the Branch.

The discussion in the group focussed on a number of points. The first was redefining the duties of the Thrust Leader, Thrust Coordinator and Section Head to determine if some of the work associated with the Section Head could be shifted to others. It became apparent that members of the group could not agree on a common set of duties for the positions, and that the duties varied with each thrust. Further, they felt that it was important for the Section Head, Thrust Leader and Thrust Coordinator for each thrust to agree on a division of duties. This process might lead to feedback which can be used to revise the original distribution of duties defined in the pre-reading material.

The group then discussed the issue of number of thrusts. All agreed that there are too many thrusts. Consolidation of thrusts might increase the work load for some Thrust Leaders, but would significantly reduce the work load on many Section Heads. However, consolidation will also make it difficult for a Thrust Leader to be technically expert in all areas covered by the thrust so his ability to formulate the best program on behalf of the client will be reduced.

The group also agreed that there is too much detail in the thrust business plans and that reporting to the clients is at too low a level. Some suggested that detail was necessary for resource distribution within the Interim Thrust Information Management System (ITIMS), especially when projects are delivered through more than one lab. However, others noted that this level of detail is one of the main reasons that some Section Heads are overloaded, since they are responsible for providing most of the information in the ITIMS submissions.

The final issue that the group discussed is whether the Thrust Leader and Section Head jobs should be separate. Some felt that the Thrust Leader duties should be a headquarters function to reduce the work load on Section Heads, provide better client interactions, and reduce the conflict of interest between formulation and delivery. Others stressed the importance of retaining Thrust Leaders at labs to ensure adequate interaction between the clients and the program delivery mechanism, and to ensure

harmony between formulation and delivery of the program. Some also felt that the major development program should be focussed in the DREs, but this would only further increase the work load on the Section Heads.

The group made a number of recommendations based on the discussion. First, they agreed that the thrust business plans (and ITIMS) should be simplified so that details are only reported at the project level, the business plans are only a few pages long, and the financial information is reported at work unit level only when necessary to allocate funds between DREs. They also recommended that each Section Head should appoint an executive assistant to ensure that the Section Head is not overloaded. The group also stressed that the "Organizational Structure for Formulation and Delivery" be should be revised to ensure that the Thrust Leaders are included in Senior Review Boards for major development projects.

Further, the group suggested some systemic changes which are required to improve the thrust approach. For example, formal signing authority should be approved for levels below Section Head, and empowerment for decision making should be given to lower levels. Further, the Performance Evaluation and Review (PER) should be simplified to reduce the work load on Section Heads. Finally, the merit system must be revamped to reward Thrust Leaders and Section Heads appropriately for the additional duties and responsibilities they now hold.

3. Working Group 3: Leveraging Resources and Attracting New Funding
(Mr. Rene Larose, DREV, Group Leader)

Working group 3 defined the issue as the need to generate outside revenues to enable the Branch to better meet the long term client requirements. This focussed the discussion on the generation of R&D revenue primarily in areas of interest to the client.

The group agreed that there were a number of assumptions in their discussions. These included that the Branch would continue to receive the same level of base funding from the Department regardless of the amount of extra revenue generated, that the Branch desires to maintain approximately 1000 full time equivalents (FTEs) within the current DRE structure and headquarters, that we must retain the current level of contracted R&D activity, and that any revenue generated will be used for staff, facilities, and to achieve corporate strategic objectives. The group assumed that the Branch has the capacity, capability and motivation to generate revenue. They also assumed that revenues can be generated by charging a fee for things that are now done free.

The discussion which followed focussed on a number of subjects. First, the group felt that there must be a clear mandate and authority to generate revenue, as well as direction concerning the levels of external funding that are required. The Branch must also gain a clear definition of what constitutes revenue and who we can receive it from. The group identified a number of sources of revenue including Specified Purpose Accounts, contracting in, royalties from licensing intellectual property, rental of facilities, grants, provision of services to other government

departments and DND, and Crown asset sales.

The group also emphasized that there must be motivation for staff to generate revenue for the Branch. They discussed a number of options including local return of the revenue to the laboratory or group, inventor royalties, cash payments for overtime used to generate revenue, and pay plan incentives or bonuses. The group felt that cash for revenue generating overtime could be immediately implemented by the Section Heads, while recommendations for pay plan incentives could be considered by the Directors General and CRAD.

Another issue the Branch must also consider is the cost associated with generating revenue; ie. marketing, overhead, loss of client support for the program, mission drift, and others. We must not lose resources or client support to gain revenue.

Also discussed was the issue of how the revenue should be applied within the Branch how much of the revenue generated by one lab should be distributed throughout the Branch and how much should be retained by the program that generated it. It was clear that revenue generated at one lab must be seen first to benefit the program that generated it, but a clear division of the net proceeds was not agreed to.

A question that arose during the discussion was how much revenue is currently being generated by the laboratories and how much more should be generated. The group felt that an updated listing of revenue generating arrangements should be compiled by the business development offices of the labs.

The group also indicated that revenue generation must be integrated into the Branch program formulation and delivery strategy so the impact on client service can be discussed. A rough breakdown of 90% of effort going to the client program and 10% available for revenue generation was thought to be a reasonable distribution.

Finally, the group discussed the role of intellectual property rights in gaining revenue, and the liabilities associated with accepting work from outside agencies. The group felt that managing intellectual property should be within the mandate of the Branch. The group also felt that liability could be a concern for product development and delivery to a fixed schedule, and that a legal opinion should be requested for such cases.

The group also felt that a number of systemic changes were required to make significant revenue generation achievable. These include a corporate approach to revenue generation within the Branch, an acceptance of the necessity of revenue generation by the clients and others in the Department, and a careful selection of personnel to undertake the revenue generation effort. The Branch must also ensure that the process is transparent to avoid mistrust by clients and others within the Department.

Finally, the process of changing the culture of the Branch must be initiated by advertising/rewarding/promoting success, and accepting/learning from our mistakes. The Section Heads are an important resource in gaining acceptance by both the clients and the working scientists.

A copy of Mr. Larose's overheads are contained in Annex F.

4. Working Group 4: Managing Information (Dr. Bert Bridgewater, DREO, Group Leader)

Since a number of information management initiatives are already underway in the Branch and the Department, the group decided to first review some of the significant results from those studies. Last year the IIME Study was completed and set out a detailed plan for information management in the Branch. The Information Management Sub-committee (IMSC) and local information management groups are also developing policies and plans. The DREnet Board is concerned with the network infrastructure to support the Branch business processes.

The Department has its own initiatives which we might become part of. They use the Defence Wide Area Network (DWAN) as the information highway and the Financial Management and Accounting System (FMAS) will be instituted in April 1998 to track resources. Project and electronic records management tools are also on the way. Any recommendations made by the group must be considered in the larger context of these initiatives which may override or preclude them.

The group assumed that the Branch will remain part of the Department of National Defence, and that the implementation of the IIME might be delayed. They also assumed that the DREnet will remain in use, and there will be limited resources for implementing any recommendations. The group also agreed that there are no perfect or long term solutions, so it is wise to implement less than perfect solutions now rather than wait for something better.

A number of items were then discussed. Under the context of the Branch initiative to capture more of the benefits of the R&D program, the group discussed ways to manage the science and technology knowledge base and our business processes to maximize the ability to protect and exploit our knowledge and expertise. We must be able to capture knowledge from both internal and external sources, capture and manage our own intellectual property, and market our expertise. Likewise, we must use information management tools to plan and deliver the program (eg. report generation), as well as track finances and archive data.

The group also felt that storage, retrieval and protection of organizational information is important to support decision making. Further, the information technology tools should make it easier for scientific managers to maintain financial and program data bases. The information technology could also be valuable in coordination of activities and training.

The group then listed the areas where improved information technology capabilities could be used and some of the problems associated with ones in use. In financial management, it was felt that we must be at least compatible with the Department initiatives. For record management, the Branch is part of a pilot project in the Department, and we must take advantage of it. In program management and planning, we have a problem in integrating all of the tools. Information overload is a serious issue at present which needs to be addressed. Software interoperability and standardization is also a problem to be addressed. Electronic security has also become an issue, particularly as we increase our use of the Internet and web technologies. Finally, we are developers of software for our clients, and we should take advantage of the products in our own business practices.

A number of recommendations resulted from these discussions. First, it was felt that all Section Heads and financial officers should have access to the DWAN and that DRDIM should make it happen. Second, the group suggested that the Branch build an integrated program planning and management application using as much commercial software as possible. Third, CRAD should enforce Branch standards for office applications to eliminate incompatibilities. Fourth, DRDIM should monitor progress on the Department records management pilot project and provide guidance to individual efforts within the Branch. Fifth, the DREs should attempt to introduce measures to reduce the amount of e-mail that individuals receive. Sixth, the Branch should adopt ENTRUST software to address some security problems. Seventh, the Branch should explore increased use of Internet technology for information management. Finally, the Branch should explore the use of its own developmental software to address at least some of the issues.

The group also identified a number of systemic changes required to address some of the issues. They felt that cultural changes such as information sharing versus protection and viewing information as an asset must occur. They also felt that environmental changes such as improved access vs. security restrictions, flexibility versus standardization and interoperability versus chaotic acquisition of new information tools must be addressed.

A copy of Dr. Bridgewater's overheads are contained in Annex G.

5. Working Group 5: Serving the Client Better (Mr. Christian Carrier, DREV, Group Leader)

The working group determined that in order to serve the client better, we must determine who the short term and long term clients are. In the short term the operations requirements directorates and the Engineering Project Management (EPM) directorates are the main clients, and the Branch response to these clients is considered good through the technical application (TA) projects in the thrusts and major development program. In the longer term, the force development and strategic planning directorates will require science and technology input from the Branch, though the type of input and the mechanism are still to be worked out. Another issue is

defining what type of science and technology support the clients require, when they require it and how much they can afford to pay for it.

The group assumed that the Branch will continue to interface with the clients through the thrust system. We must also assume that the Canadian Forces will remain as our primary client, and that other initiatives such as revenue generation and industrial support will remain secondary. However, we must assume that the Branch will adopt a more business-like culture, and the CF will accept that work for and with other clients and partners will form a significant portion of the program. Finally, the group assumed that they should only deal with issues which are within their control or influence.

The group then discussed the key components of an effective relationship with the CF and how we may improve on the existing approach. First, we need to understand what the client requirements are, and to do this we must continue to increase our interactions with them. The Thrust Leader and Thrust Coordinators must make more time to meet with clients and discuss their requirements, and use any new computer interactive tools that aid in this effort.

The group indicated that we need to formulate our program based on expressed client needs, and we must define it in terms of capabilities and deficiencies, with specific objectives, time lines, milestones and deliverables. Although the thrust system does this to some extent, a better alignment of the thrusts with military requirement directorates is needed. We must also build in more flexibility in the thrust system to address rapidly changing requirements and new threats as they are uncovered.

The group also suggested that the clients should have more insight into the program delivery through progress meetings held at key points through the projects. In this way, they would become sensitized to the difficulties associated with the R&D process, and would also become more educated on the benefits of the R&D program to the CF.

The issue of cost effectiveness in delivering the program was also discussed. We must implement cost management and accounting measures which will demonstrate to the clients that they are receiving high value for their investment in the Branch, and that budget targets are being met.

The group also believed that a conflict of interest exists in double-hatting Thrust Leaders and Section Heads. They felt that both are full time jobs and should be independent of one another. This opinion is in direct conflict with Working Group 2, who stressed the importance of the Section Head/Thrust Leader duality to ensure continuity from formulation to delivery of the program.

In making recommendations, the group again stressed the need for improved communications with the clients, and to do this they suggested that the operations research and force development directorates be included in the Thrust Advisory

Groups. They also suggested that Director General Strategic Planning be considered a new client group. The Thrust Leaders should be sure to formulate their thrust activities in terms of military requirements/capabilities, and be rigorous in including milestones, schedules and deliverables.

In order to increase the cost effectiveness of program formulation and delivery we must increase focus by reducing the number of thrusts and aligning them more closely with client groups. This group also recommended that Scientific Advisors and Thrust Leaders be located in headquarters and perform most formulation functions, including identifying science and technology requirements, acting as Project Director on major development projects, writing the thrust business plans, etc. The Section Heads would then be responsible for most of the delivery functions of the program, including acting as scientific authorities for all major development projects, DIR projects, technical investigations and applications projects, international collaborations, industrial partnering, etc.

The group identified a number of systemic changes which must be accomplished to improve service to the clients. These include ensuring that both clients and everyone in the Branch understands our business planning process with all of the steps between the generation of science and technology requirements and the allocation of resources to address them. We must then strive to follow it and attempt to reduce the time for the whole process to take place so that we can be more responsive and flexible for changing requirements.

The group also highlighted that we must develop better information and project management tools. They suggested that all Section Heads should be connected to the military network, that we should adopt or develop project management tools that help the thrust leaders and section heads rather than focussing on support function needs.

In conclusion, the group emphasized that the thrust formulation must be separated from the program delivery functions. They believe that both are full time jobs which must be managed more diligently to demonstrate to the client all of the steps from defining a science and technology requirement to producing a finished system in the field. They also felt that we must also form closer partnerships during the development of equipment to ensure that the systems meet client needs and are procured by the CF.

A copy of Mr. Carrier's overheads are contained in Annex H.

6. Working Group 6: Implementing a Business Development Program (Mr. Noel Thomas, DRES, Group Leader)

The group identified that implementing a Business Development Office was not an issue but a goal which is necessary for the Branch to keep operating. They emphasized a number of reasons for setting up the office, and these include to increase our resource base (money and personnel), to maximize the product from our

budget, to maintain and leverage the core capabilities of the Branch, and to provide the tools/mechanisms needed by individual scientists to implement efforts to gain revenue and leverage our base resources.

The group assumed that most of the Business Development Office effort will be aimed at marketing our technology outside of the Department. A separate effort will continue to market our capabilities to the CF clients. They also assumed that initiating a business Development Office will provide some net benefit to the Branch. They agreed that the Branch will continue with the same mandate which states that our primary focus is to support the CF, and that any business development effort outside the Department will be undertaken to enhance or supplement our efforts on behalf of the CF clients. They also agreed that it will be necessary to manage intellectual property from within the Branch to increase efficiency and maintain credibility with collaborators; ie. we must be able to make our own deals with respect to intellectual property licenses. The group also felt that the Branch must be able to retain revenue within a single operating budget to provide the flexibility needed to apply any revenue generated to enhance and maintain our capabilities.

All participants agreed that a central office was necessary to coordinate the business development efforts of the DREs and promulgate policy. They also felt that each lab should have a business development office with at least one full time equivalent devoted strictly to business development. The group suggested that the Business Development Implementation Planning group's resource levels should be accepted; ie. a total of ten or eleven full time equivalent positions in the Branch should be devoted to business development. The group also identified the need for a documented form of performance measurement for all business development offices.

The group then attempted to define key activities of a central business development office. These include

a. Policy definition, business development framework and implementation guidelines,
b. Activity coordination for all of the individual offices in the labs
c. Business development strategy definition,
d. Marketing, sales and business plans
e. Corporate image development for the Branch,
f. Intellectual property and DIR program management,
g. Quality management and risk assessment,
h. Networking,
i. Advertising capabilities outside of the Department,
j. Understanding and monitoring science and technology trends,
k. Costing, planning, forecasting and assessing, and
l. Provision of advice and support to management and staff.

Having defined a number of duties, the group then made recommendations on the organizational structure of the business development offices, their key activities, the mechanisms to be used, resources, marketing and revenue sharing.

The group suggested that the Central Business Development Office should be responsible for overall strategy, policy, corporate marketing, intellectual property, the DIR program, coordination, and corporate resources. It should be set up as quickly as possible since the laboratories are already in a position to make significant gains in revenue. The DREs should be responsible for supporting and guiding business development opportunities in the laboratories and liaising with the central office on policy and identification of new opportunities. These offices should also be set up as soon as possible if they do not already exist. The key activities of the business development offices may change as the roles become more apparent, and the group recommended that they remain flexible for the present. The Business Development Implementation Steering Committee should develop a strategy for defining the activities of the central office and the laboratory offices.

The group felt that the levels set for financial responsibility for entering into projects should mirror existing spending authorities. The group also felt that there may be some problems with government regulations regarding fair treatment of all potential partners when forming specific agreements with industrial partners, but that the Branch would have to try to minimize the risk and deal with any problems as they arise. Perhaps Letters of Interest could be used in some cases.

The group recommended that the Central Business Development Office should comprise one executive, one marketing officer, and the DIR staff. Each DRE should have a minimum of one full time equivalent position devoted to the business development office. The group also stressed that there would be a need for a significant amount of training for the personnel involved in business development. The Directors General should implement the appropriate plans for their laboratories.

The group suggested that an outward looking marketing plan should be developed. The role of the central office should be to provide advice, training and coordination for individual laboratory plans. All should participate in developing marketing plans for their laboratories. The group could not agree on how to distribute the revenue generated through the business development offices. Some felt that the lab that generated the revenue should keep it, while others believed that revenue should be a corporate resource. The Business Development Implementation Steering Committee should make a proposal to RDEC on this issue.

The group also felt that a number of systemic changes had to occur for the business development effort to succeed. They stressed that the Branch must manage its own intellectual property, and that we must be granted the authority to enter into partnerships or cost sharing arrangements without always going competitive. They suggested that the approval process should be delegated to the lowest appropriate level. Finally, they indicated the need for a culture shift both in the scientist attitude toward business development and in the reward system for being successful. We should review the reward systems being instituted by other government departments undertaking similar efforts.

A copy of Mr. Thomas' overheads are contained in Annex I.

E. Consolidated Recommendations

On the second day of the workshop, each of the working group leaders presented a briefing for Dr. Leggat and Dr. Kimbell which summarized their group deliberations. Following these presentations, Dr. Leggat asked for a more precise list of recommendations and an action plan for carrying them out. Because groups two and five, and three and six, had a number of common recommendations, they were asked to meet together to develop a set of common recommendations and a joint action plan. Groups one and four reconvened to produce their action plans individually.

1. Working Group 1. Investing in Forward Looking Technology

Action	Who	When
Establish a protected technology investment fund which represents 5-10% of the Branch resources (both funding and personnel).	RDEC	immediate
Sell the client at the Overview Group and Working Group level on the need for a forward looking strategy and the technology investment fund	Thrust Leaders/ DSAs	This planning cycle
Establish tight sets of criteria and procedures for submitting and reviewing technology investment fund proposals. Ensure technically expert reviews of submissions	Technology Assessment Working Group	immediate
Increase the amount of forward looking R&D within the thrusts	Thrust Leaders	this cycle
Acquire the freedom to attract, train, and retain the needed personnel - Draft a position paper for CRAD - Meet with Senior Management (ADM level) of other S&T departments & organizations to compare policies and determine ways to improve situation - Examine ASD solutions	 DS Pol CRAD ASD team	 Dec 97 immediate immediate
Review and prioritise infrastructure (facility and equipment) requirements associated with the technology investment strategy	DGs, Section Heads	this year
Survey internal and external sources of infrastructure funding and make recommendations on best approaches to obtaining the necessary funds	DRMPC	this year

2. Working Groups 2 and 5. Defining the Roles of Thrust Leader, Section Head and Thrust Coordinator and Serving the Client Better.

Action	Who	When
Simplify thrust business plans and reports. Report to client only at project level. Show finances/resources at work unit level only when necessary to allocate resources to individual DREs. This will reduce the workload on Section Heads and clients.	Thrust Leaders, DSAs, SAs	this planning cycle
Rationalize the number of thrusts. Align them where possible with client requirements so that there is one thrust per military office of prime interest (OPI). This will save Branch resources and reduce client overhead	Thrust Leaders, DSAs, SAs	next Overview Group meetings
Pursue client sponsors/partners for long term R&D activities by expanding Thrust Advisory Group and Overview Group memberships.	Thrust Leaders/ Coordinator	immediate

3. Working Groups 3 and 6. Leveraging Resources and Attracting New Funding and Implementing a Business Development Program

Action	Who	When
Update the current status of revenue generation in each of the labs and the mechanisms being used	SectionHeads BDOs	immediate
Confirm CRAD authority to retain and roll over revenue generated through contracting in, specified purpose accounts and licensing arrangements for our intellectual property	DGRDCA, CBDO	next few months
Define the amount and types of revenue generation projects which should be pursued - provide interim guidelines until permanent ones are developed	CBDO	soon
Complete handbook on revenue generation and distribute	DGRDCA	soon

4. Working Group 4: Managing Information

Action	Who	When

Ensure that financial officers in the DREs gain access to DWAN and all Section Heads are connected to BANYAN	DRDIM DRE IT	Mar 98
Build an improved and integrated program planning and management tool (either COTS or web-based)	DRDIM	Sept 98
Enforce branch standards for all office application software such as word processing, presentation and spreadsheet applications	CRAD	Soon
Develop policies for collecting and maintaining records from official e-mail messages. Maintain awareness and implement electronic data and records management system (EDRMS) as soon as available. Interim individual policies should be implemented by DREs	DRDIM DREs	medium soon
Investigate ways to make better use of latest information sharing technologies, including internet, intranet between labs, and extranet with external partners to maintain security while streamlining information transfer	all	short to medium
Explore use of internally developed information tools for addressing the need to capture and manage the full benefits of R&D activities	DRDIM	medium
Address internet security concerns (perhaps through ENTRUST adoption)	DREs	soon

F. Systemic Issues

A number of systemic issues which require high level resolution were also identified. These include the lack of consistency between the formulation and delivery strategies and the performance review and reward mechanisms for DSs. There were also discussions concerning the need for empowerment (signing authority, etc.) at lower levels to reduce the workload on Section Heads.

In the information management forum, corporate buy-in to information sharing versus protection was seen as a systemic issue, as was the need to emphasize interoperability by using common office software versus allowing everyone to have their own favourites.

In the area of revenue generation and business development all agreed that the Branch must have control of its own intellectual property and be granted the flexibility to introduce some novel business practices to attract funding/partners. The CF clients must also accept the need for the Branch to undertake a revenue generation effort, and the Department must be willing to allow the Branch to manage its own revenue.

G. General Observations, Feedback and Unresolved Issues

As well as the specific recommendations outlined above, the workshop produced a number of additional benefits and identified a number of unresolved issues.

1. Benefits:

The workshop provided an excellent opportunity for all of the DRDB Technology Leaders to become acquainted with one another, share experiences, and help each other address individual and common problems. Among the major benefits of the workshop was the opportunity for the new CRAD to introduce himself to all of his Technology Leaders at one location and express his view of the way ahead for the Branch. This, along with the results of the workshop discussions, helped to define and gain acceptance for a common vision which the Technology Leaders will be able to work toward. Undeniably, the workshop was a good team building exercise.

2. Unresolved Issues:

During the question periods and in the working groups a number of important issues were identified which were not adequately addressed in the direct discussion topics. These issues could form the basis of future workshops or could be discussed at other meetings of opportunity.

A key issue which was identified as a continuing problem is the lack of communication among the DREs, and between the DREs and the Branch headquarters. The result is a continued lack of trust and cooperation. A prime example which was highlighted was the instance of a major development project which was initiated in headquarters without the knowledge of the appropriate Thrust Leader in the DRE. Addressing this issue is critical in building a better team attitude within the Branch and avoiding duplication of effort.

Although the participants were unanimous in their agreement that the Technology Investment Strategy is basically sound, many highlighted the need for a clearer description of the roles of the Technology Assessment Working Group, the process of creating the Strategy, and the process for creating and managing the Technology Investment Fund. The Group should produce and distribute a summary of its progress so far, defining the roles, mandate and process to all middle managers so that they can better understand where the Group "fits" within the new Branch mandate.

A final issue which was discussed by a number of the working groups was the roles and locations of the Scientific Advisors, the Deputy Scientific Advisors, the Thrust Leaders and the Thrust Coordinators. Many felt that the jobs could be consolidated at Headquarters to provide easier access to the clients and reduce the amount of work at the Section Head level in the DREs. However, an equal or greater number believed that the separation of the formulation of the program from the delivery would adversely

affect cohesion of the program and would reduce the access of the Section Heads to the client. Lack of trust, communication and teamwork are also contributors to this issue.

H. Monitoring Progress of Action on Recommendations

The workshop produced a number of recommendations and an action plan for implementing them. After six months, a review of the success in implementing the recommendations will be conducted and reported. All participants will then be asked to comment again on the success of the workshop and recommend improvements for the next one.

I. Conclusion

In conclusion the workshop was considered to be a valuable exercise by attendees. A number of issues were addressed, concrete recommendations were made, and an action plan to complete them was initiated. In particular, the technology investment strategy, the business development effort, and the issue of overworked Section Heads will benefit from completion of the recommended actions.

J. Participant Survey Results

At the completion of the workshop, participants were asked to participate in a survey to determine the level of satisfaction with the subjects and working group outcomes. The questions which were posed to participants are the following:

1. The workshop met my expectations.
2. I have a better understanding of the future direction of CRAD.
3. The recommendations from the Working Groups are workable.
4. The single most important thing to change in CRAD is:
5. The biggest barrier to change is:
6. Ideas on how we can stay engaged in the evolution of CRAD.

A summary of the results of the survey is contained in Annex J.

ANNEXES

Annex A: Agenda For Technology Leaders Workshop

Location

NAV Canada Centre
1950 Chemin Montreal
Cornwall, ON K6H 6L2
(613) 936-5003

19 October 1997

1700-1900	Delegates Arrive at NAV Canada Centre	
1900-1930	Objective of Workshop and Updates on Branch Initiatives	Dr. Leggat
1930-2200	Meet and Greet With CRAD and DGs	

20 October 1997

0900-0930	CRAD Perspective on Renewal	Dr. Leggat
0930-1000	Question and Answer Period	All
1000-1015	Coffee	
1015-1100	Technology Investment Strategy	Dr. Marwood
1100-1200	Form Working Groups/Begin Discussions	All
1200-1300	Lunch	
1300-1700	Working Group Discussions	All
1700-1900	Dinner	
1900-2100	Completion of Working Group Discussions (if necessary)	All

21 October 1997

0900-1200	Presentations by Working Group Leaders	WG Leaders
1200-1300	Lunch	
1300-1500	Way Ahead: Implementing Actions/Recommendations	All

Annex B: CRAD Perspective On Renewal Briefing Slides

Defence Research and Development Branch

R&D Beyond 2000...

Defence R&D Branch / Direction R et D pour la défense

Outline

- Our new Vision
- Our Achievements
- Business Transformation Strategy
- Dealing with Program Reductions
- Ten Point Strategy for the Future
- Role of Technology Leaders
- Issues for Working Groups

Defence R&D Branch / Direction R et D pour la défense

R&D Branch Vision

- As the National Defence science and technology agency, provide leadership to the Canadian Forces and the Canadian Defence industrial base into and through the next century
  - conduct a focussed in-house R&D effort
  - support CF and industrial partners on S&T issues
  - influence defence strategic planning

Defence R&D Branch / Direction R et D pour la défense

Achievements to Date

- The R&D program is now focused on Clients
- The R&D Advisory Council is established
- A Business Transformation Strategy has been initiated
- A Technology Investment Strategy has been initiated
- Government mandated program reductions have been addressed

Defence R&D Branch / Direction R et D pour la défense

Focus of Program on Client

- Scientific Advisors to each of the Client Groups allow easy access to Branch
- Thrust approach to program formulation and delivery allows input from clients at working level
- Overview Groups are instrumental in planning and evaluating R&D activities
- RDPRC allows high level guidance for R&D activities

Defence R&D Branch / Direction R et D pour la défense

R&D Advisory Council Meeting

- Our position
  - We lead the national Defence S&T network
  - We have a coherent management framework
  - We will capture & manage the full benefits of Defence R&D activities
  - We will provide the Technology perspective for Defence strategic decision making

Defence R&D Branch / Direction R et D pour la défense

R&D Advisory Council Meeting

- Council Feedback
  - Optimize the Defence R&D infrastructure
  - Improve mechanisms for dealing with industry
  - Increase the value of R&D by capturing all the benefits
  - Provide oversight and leadership to all S&T activities in the Department

Business Transformation Strategy

- DND Corporate Contribution and Visibility
  - prepare S&T Issue Papers
  - contribute to Departmental Strategic Planning
- Technology Leadership
  - Technology Assessment Group
    - develop Technology Investment Strategy
    - perform Technology Forecasting
  - Technology Investment Fund
- Business Practices
- Alternative Service Delivery

Business Transformation Strategy

Business Practices

- Business Planning
- Collaboration and Partnering
- Revenue Generation
- Commercialization/Technology Transfer
- Marketing
- Activity Based Costing - costing/pricing our services and products
- Performance Measurement - assessing the benefits, quality and cost-effectiveness of the Defence R&D Program
- Communications

Business Transformation Strategy

Alternative Service Delivery

- Goal:
  - determine the best delivery mechanism for Defence R&D
- Process:
  - use ASD methodology to analyze R&D Branch and assess various organizational options
- Status:
  - on schedule to have ADM(Mat) make preliminary recommendation by December
- Implications:
  - will result in new way of doing business
  - requires change in culture

Program Reductions

- Branch FTE reductions mirror Departmental and ADM Mat losses
- Budget reduced by one-third includes recent $18.4M reduction
- Single Operating Budget granted to help deal with current reductions
- Revenue generation and leveraging being pursued to offset any further reductions
- Personnel rejuvenation and renewal high priorities

Ten Point Strategy For the Future

- Customer focus and profile
- Motivated workforce
- Highly networked R&D function
  - Linkages to industry
  - Exploitation of international opportunities
  - Integrated approach with procurement and life cycle support

Ten Point Strategy for the Future

(cont.)

- **Flexibility for revenue generation**
  - Technology generation and intellectual property revenue
  - Full visibility of costs
  - Flexibility in the management of revenues
- **Technology leadership**
  - Establish the position of Defence Chief Scientist
  - Department profile

Role of Technology Leaders

- Help to build more effective strategies
  - input to better strategies
  - feedback to improve existing strategies
- Provide leadership in implementing strategies at working level
  - scientific and technological leadership
  - improved client relations
  - more capable and motivated workforce
  - improved management structure

Issues for Workshop

- Investing in forward looking technologies
- Defining the roles of Thrust Leader, Thrust Coordinator and Section Head
- Leveraging resources and attracting new funding
- Managing information
- Serving the client better
- Implementing a business development program

Annex C: Technology Advisory Working Group Slides

Technology Assessment Working Group

PROGRESS REPORT
26 September 1997

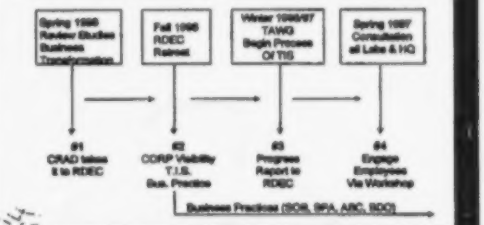
Defence R&D Branch / Direction R et D pour la défense

OUTLINE

- The Context
- Technology Assessment Working Group TOR
- Investment Strategy
- Technology Competencies
- Defence Technology Areas
- In-house competencies required
- Budget by Defence Technology Area
- S&T Clusters
- Technology co-ordination concepts
- Organization Model
- Technology Investment Co-ordination
- Next steps

Defence R&D Branch / Direction R et D pour la défense

WHERE THIS INITIATIVE CAME FROM



Defence R&D Branch / Direction R et D pour la défense

Technology Assessment Working Group

- Responsible for recommending, monitoring and reporting a Technology Investment Portfolio for the Defence R&D Branch by:
  - identifying future defence technology needs;
  - recommending changes in the R&D program to better respond to future defence needs;
  - reporting on the state and balance of technology investment in the Branch
  - ***Managing the Technology Investment Fund***

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Investment Strategy

Defence R&D Branch / Direction R et D pour la défense

Technology Competencies

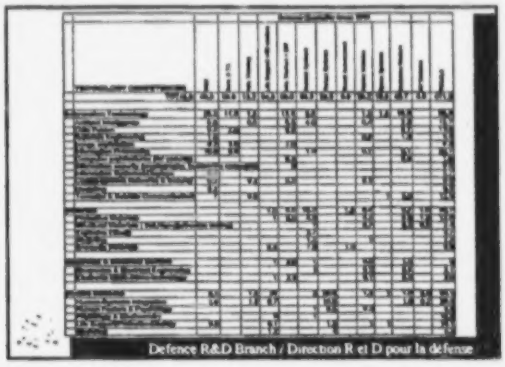
Sub-Technologies were identified for each

- Information Technology
- Materials
- Electronics & Electrical Devices
- Human Sciences
- Simulators & Trainers
- Chemical, Biological & Medical
- Design Aspects - Platforms & Weapons
- Electronic Warfare
- Mobility, Guidance & Control Systems
- Sensor Systems
- Weapons

Defence R&D Branch / Direction R et D pour la défense

Defence Technology Areas
In Order of Priority

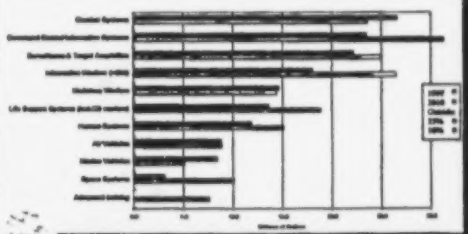
- Command Control Information Systems
- Surveillance & Target Acquisition
- Advanced Training
- Life Support Systems (including CB Defence)
- Information Warfare (including EW)
- Combat Systems
- Human Systems
- Marine Vehicles
- Space Systems
- Undersea Warfare
- Air Vehicles



In House Scientific Competence
Needed Number of Scientists

Defence Technology Areas	1997	2010 Required	ABD & Reliance on Partners
Command Control Information Systems	34	48	35
Surveillance & Target Acquisition	48	62	48
Advanced Training		12	13
Life Support Systems (CB warfare)	48	54	48
Information Warfare (incl. EW)	30	61	57
Combat Systems	51	68	48
Human Systems	20	32	29
Marine Vehicles	28	29	NRC / NRCAN?
Space Systems	14	10	15
Undersea Warfare	48	48	41
Air Vehicles (NRC)	5	5	2
Threat Assessment		9	(accompanied)
Total	332	411	330

Budget - Defence Technology Areas



Technology Investment Strategy
PURPOSE

1. To realign the R&D Program to look at future Technology to respond to clients.
2. To rationalize the program to:
   - Reduce Redundancy
   - Reduce Overlap
   - Reduce Management Overhead
   - Increase Efficiency
3. To ensure appropriate Technological competence

Technology Co-ordination Concepts

- Consolidation
  - Concentrate Technology & Expertise in one facility
  - Exception may be facilities for testing
- Lead Lab
  - Responsible for sustaining technology Competency
  - Posting of professionals to other labs as required
    - Become part of a team, focus on projects
- Hub
  - Inverse of Lead Lab - Technology is coordinated by a Hub Leader and regular meetings
  - Exchange information and practices

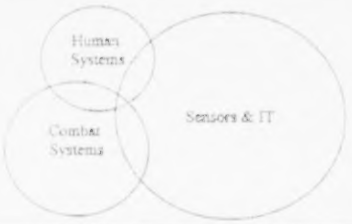
RECOMMENDATIONS

Based on SWOT Analysis

Technology Competency	Recommendation
Weapons	Consolidate
Sensor Systems	Consolidate with IT
Information Technology (IT)	Consolidate w/ Sensors
Chemical, Biological & Medical	Consolidate
Mobility, Guidance & Control	Consolidate
Human Sciences: Human Factors	Lead Lab (DCIEM)
Simulators & Trainers: Training	Lead Lab (DCIEM)
Modeling	HUB (Expand DIS WG)
Signature Management	HUB (Leader at DREO)

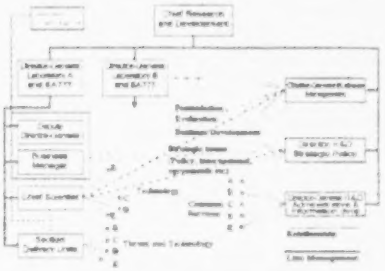
S&T Clusters

for rationalizing the Technology Investment



Criteria for Interim Organization

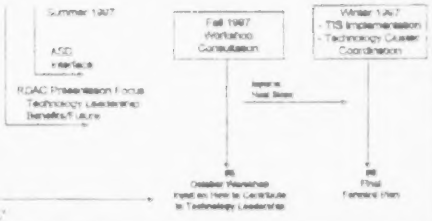
- Reduce Workload
- Clarify roles - Formulation/Delivery/Advice
- Integrate Business Management
- Sustain Client Services (Thrusts)
- Accommodate Technical Leadership (Forecasting)
  - **Sustain Technology Competency** for the Future
- Define a distinct Value-Added Role for HQ
  - **Integrate Performance Evaluation** into Formulation
- Limit to Internal Organizational changes
  - Not contrary to **any** ASD Outcome



Interim Organizational Model

TECHNOLOGY INVESTMENT COMMITTEE

Future Activities



RECOMMENDATIONS

Based on SWOT Analysis

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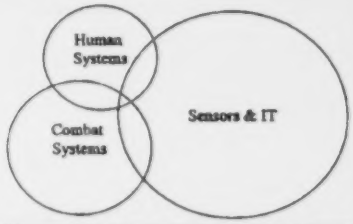
Simulators & Trainers: Training	Lead Lab (DCIEM)
Modelling	HUB (Expand DIS WG)
Signature Management	HUB (Leader at DREO)

S&T Clusters

for coordinating the Technology Investment



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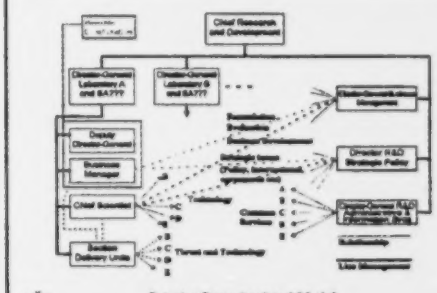
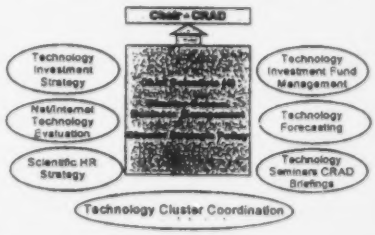
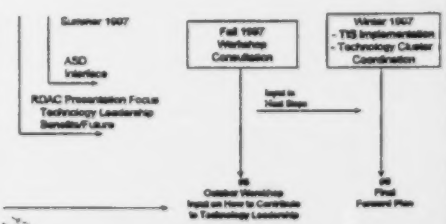


Interim Organizational Model

TECHNOLOGY INVESTMENT COMMITTEE



Future Activities



Annex D: Working Group 1 Slides

Working Group 1

Investing in Forward Looking Technology

by

Dr. Ron Graham

Defence R&D Branch / Direction R et D pour la défense

Issue Definition

- We need to address CF requirements in the short, medium, and long terms
- The thrust management system is doing a good job meeting short and medium term needs
- There is a requirement for strategic investment in forward-looking technology to meet long term needs

Defence R&D Branch / Direction R et D pour la défense

Issue Definition (2)

- need to manage all aspects of our investment, including contract dollars, personnel resources, capital equipment and infrastructure
- need to address both the process of managing our strategic investment and the identification of areas for strategic investment

Defence R&D Branch / Direction R et D pour la défense

What constitutes a strategic investment in technology?

- high payoff research that is not handled by the normal process
  - may be high risk, or
  - broad application to a number of client groups makes it difficult to attract a specific sponsor
- includes changes to both program and facilities

Defence R&D Branch / Direction R et D pour la défense

Strategic Investment Fund: Discussions & Recommend.

- Need to set aside a fixed proportion of contract and SWE dollars for strategic research (5-10% recommended) (RDEC)
- These funds are not residual, but an essential part of the program
- Need to sell the CF at a high level on the requirement for this investment (SA's, CRAD)
- critical to develop expertise in house

Defence R&D Branch / Direction R et D pour la défense

Strategic Investment Fund (2)

- While defence relevance is mandatory, investments are to be selected primarily on the basis of technology development
- Funds should not be divided by client group, but expect long term balance between client groups will be preserved
- Must identify a corporate client for this research (TAWG)

Defence R&D Branch / Direction R et D pour la défense

How do we select the technologies for investment?

- committee of sages (top down)
  - may allow more radical change in direction
  - who
    - CSe +
    - link with D Strat P?
- market forces (bottom up)
  - best ideas (consistent with the criteria) are supported
  - competitive, peer-reviewed process based on merit

How do we select the technologies for investment?

- Strategic guidance should be provided, but no proposals should be excluded
- investment strategy must be updated often
- best ideas will come from the coal face
- best proposals should go ahead, regardless of area

SIF Selection Criteria

- quality/scientific merit
- breaking new ground/novel
- defence relevance
- fit with technology investment strategy
- *should potential for wealth generation be considered? (Yes, as a tie-breaker)*

Proposal Requirements

- detailed workplan/deliverables identified
- maximum 3 years/$500K ($1M *rec.*)
- at least 25% internal lab contribution
  - personnel
  - local O&M
- *risk assessment*
- *technology retention should be addressed*

Other Strategic Investment Issues

- Facilities
  - a drawing card for industry
- look at other funding sources to upgrade facilities
  - explore joint ventures with industry to capitalize on needs larger than our own
  - look at other sources of infrastructure funding

Personnel

- This fundamental systemic issue must be addressed (RDEC, TB)
- must be able to hire, train, and retain a qualified workforce
- ASD should consider this requirement
- Career development:
  - exchanges (SHs, DGs, RDEC)
  - contacts with military
    - operational experience (SHs)

Other Recommendations

- look at foreign invitations to participate in new activities, e.g., Information Operations with the US (DESA)
- monitor, and consider collaborating on DARPA opportunities (DESA)
- Request lab DGs invite DGSP (WG1)
- Push the envelope in all thrusts by investing in forward-looking technology (TLs, SHs)

Conclusions

- Critical for the long term health of the branch to invest strategically in forward looking technology
- 5-10% of contracts and SWE appears like a realistic target
- No major changes to existing thrust management system are required

Annex E: Working Group 2 Slides

Working Group 2

Defining the Roles of Thrust Leader, Thrust Coordinator and Section Head

by
Dr. Greg Lessma

Issue Definition

- Section Heads overloaded with work
- conflict of interest in double hatting Section Heads/Thrust Leaders
- defining common duties of Thrust Leader, Section Head, and Thrust Coordinator
- major projects initiated without Thrust Leader input
- misalignment of Thrust approach with program delivery organisation and rewards

Assumptions

- thrust system remains relatively unchanged
- Section Heads are only doing Section Head level work
- need to free up Section Head time for longer term planning and technology investment issues

Discussion

- redefining duties of Thrust Leader, Thrust Coordinator and Section Head
  - duties dependent on particular thrust so defining common duties might be difficult
  - thrust leader/thrust coordinator/section head for each thrust decide on division of duties
  - feedback to provide common set of duties for each??

Discussion (cont.)

- reduce number of thrusts significantly
  - all agreed that there are too many thrusts
  - consolidated thrusts will require more work for some Thrust Leaders but less for some Section Heads
  - consolidation will make it difficult for Thrust Leader to have adequate knowledge and expertise in every area

Discussion (cont.)

- simplify reporting of thrusts to client
  - too much detail in thrust business plans
  - detail necessary for allocating resources with ITIMS, especially when work units delivered in more than one lab
  - this would reduce workload on Section Heads since they do most of the preparation on Thrust Business Plans

Discussion (cont.)

- separate Thrust Leader and Section Head jobs
  - disagreement on implementation
    - Thrust Leader should be a HQ function to reduce workload on Section Heads, provide better client interactions, and reduce conflict of interest between formulation and delivery
    - Important to retain Thrust Leaders at labs to ensure adequate interaction between client and program delivery, and to ensure harmony between formulation and delivery

Recommendations

- Thrust business plans should be simplified
  - report details only at the project level
  - reduce plan to a few pages
  - only finances prepared as work unit level and not shown to client
- Create executive assistants for Section Heads
  - need to define job description
- revise "The Organizational Structure for Formulation and Delivery"
  - ensure appropriate thrust leader is full member of SRB on all major projects

Systemic Changes

- empowerment to lower levels to reduce workload on Section Heads (eg, signing authority)
- PER simplified to reduce workload on Section Heads
- merit system revamp to reward Thrust Leader and Section Head duties

Annex F: Working Group 3 Slides

Working Group 3

Leveraging Resources and Attracting New Funding

by

Mr. Rene Larose

Issue Definition

- To generate outside revenues to enable DRDB to better meet its client's needs

Assumptions

- Maintain Department funding level
- DRDB is to retain 1000FTEs within current DRE structure and CRAD/HQ
- Retain current level of contracted-out R&D activity
- Revenue generated will be used for
  - staff and facilities
  - Achieve corporate strategic objectives

Assumptions

- DRDB has capacity and capability to generate revenue
- Some revenues will come from doing the same things for a fee which are done now for free.

Discussion

- Authority
- Clear Mandate
- Clear Definition Of Revenue
- Staff Motivation
- As-Is and To-Be Defined
- Integration into DRDB Business Practice
- Management of IP/Liability Issues

Recommendations

	SH	BDO	CBDO	DG	CRAD
Authority			X		X
Mandate	X				X
Definition			X		
Motivation	X			X	X
Status		X			
Practices	X			X	
IP/Liability			X		

Annex F: Working Group 3 Slides

Working Group 3

Leveraging Resources and Attracting New Funding

by

Mr. René Larose

Issue Definition

- To generate outside revenues to enable DRDB to better meet its client's needs

Assumptions

- Maintain Department funding level
- DRDB is to retain 1000FTEs within current DRE structure and CRAD/HQ
- Retain current level of contracted-out R&D activity
- Revenue generated will be used for
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- Authority
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- Integration into DRDB Business Practice
- Management of IP/Liability Issues

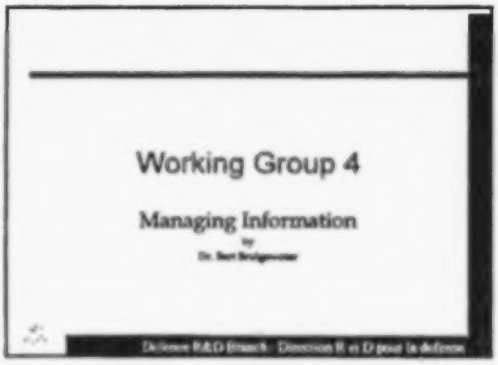
Recommendations

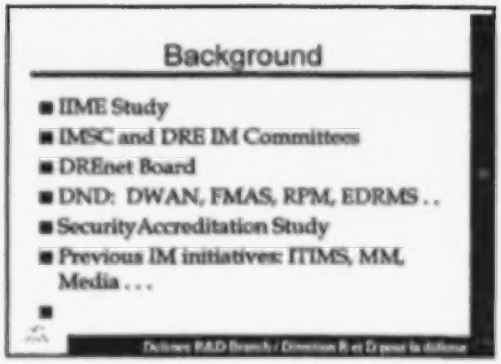
	SH	BDO	CBDO	DG	CRAD
Authority			X		X
Mandate	X				X
Definition			X		
Motivation	X			X	X
Status		X			
Practices	X			X	
IP/Liability			X		

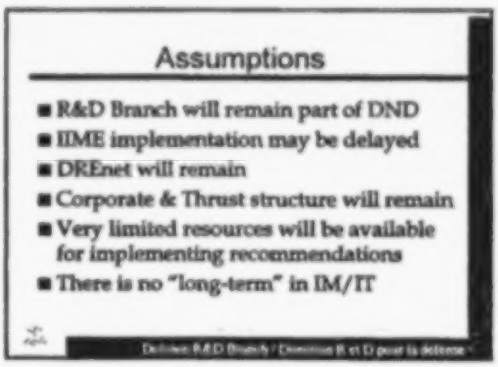
Systemic Changes

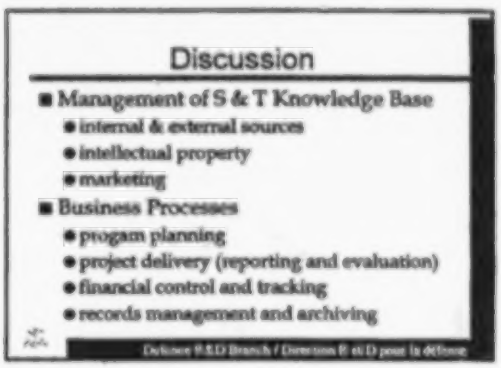
- DRDB corporate approach to revenue generation is required
- DND corporate acceptance of procedures, revenue retention etc
- DS Selection criteria/process
- Delegation/Accountability/Responsibility
- Transparency

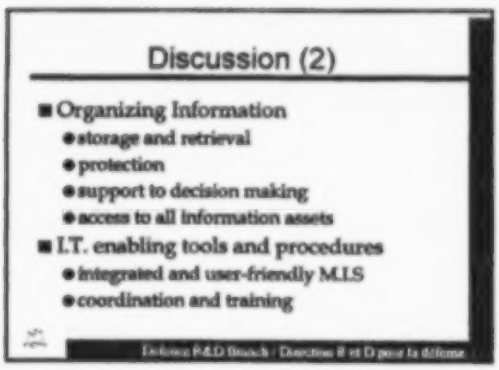
Annex G: Working Group 4 Slides

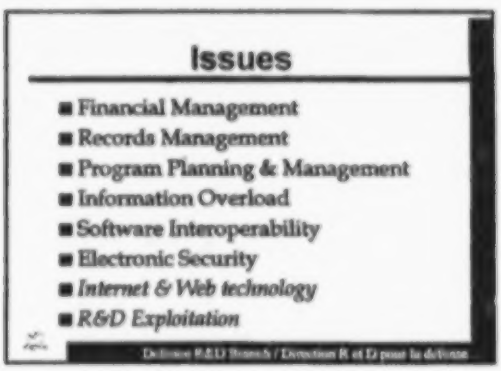



Background
IIME Study
IMSC and DRE IM Committees
DREnet Board
DND: DWAN, FMAS, RPM, EDRMS . .
Security Accreditation Study
Previous IM initiatives: ITIMS, MM, Media . . .


Assumptions
R&D Branch will remain part of DND
IIME implementation may be delayed
DREnet will remain
Corporate & Thrust structure will remain
Very limited resources will be available for implementing recommendations
There is no "long-term" in IM/IT







ISSUE	RECOMMENDATION	WHO	When
1. Financial	• DWAN access	DRDIM	S
2. Records	• EDRMS Pilot	DRDIM	M
	• E-mail procedures	DREs/IT	S
3. PPM	• Alternatives to ITIMS (web-based ?)	DRDIM & DREV	S
	• Interoperable financial & management tools	DRDIM & DREs	M
4. Info. Overload	• E-mail procedures	DREs	S
5. S/W Interoperability	• Branch standards for office applications	IMSC	S
6. Electronic Security	• ENTRUST Installation	DREs	S

Defence R&D Branch / Direction R et D pour la défense

OPPORTUNITY	RECOMMENDATION	WHO	When
1. Internet Technology	• Web-based applications	all	-
	• Intranets at DREs	DREs	S
	• "extranets" for partners	DREs	S
	• DREnet capabilities	all	
2. R&D Exploitation	• Knowledge management tools	DREV	M
	• Secure Information handling	DSACCIS	M
	• HCI	DCIEM	M

Defence R&D Branch / Direction R et D pour la défense

Systemic Changes

- Cultural changes
  - Information sharing vs. protection
  - Information as an asset
  - Corporate buy-in
- Environmental Changes
  - Improved access vs. security restrictions
  - Flexibility vs. standardization
  - Interoperability vs. chaos

Defence R&D Branch / Direction R et D pour la défense

Annex H: Working Group 5 Slides

Working Group 5

Serving the Client Better

by

C. Carrier, G. Dumas, Dr. G.Otis, Dr. A.Vallerand, Cfd D. Parks, R. Hewitt, Dr. J.M. Garneau, J. Kennedy, R. Hollingshead & R. Roy

Issue Definition

- Clients:
  - Short-Term: Requirements, EPMs
  - Long-Term: Force Dev, Strategic Planning
- Provide the client with:
  - the right Advice/Technology/Support
  - at the right time
  - cost effectively

Assumptions

- We will continue to manage by Thrusts
- The CF will remain our primary clients
- We will become more business-like
- Remain within our realm of Control/Influence

Discussion

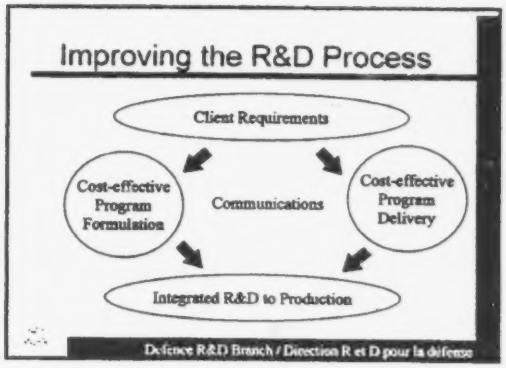
- Mutual understanding of Requirements, expectations and capabilities
- Formulation - Flexibility, milestones, meaningful deliverables, integrated
- Delivery - more meaningful interaction with clients, timeliness
- Cost-effectiveness -Improve tooth-to-tail ratio/project management rigor
- DG/SA, SH/TL - conflict of interest

Recommendations

- Improve Communications, e.g.:
  - For long-term, include OR & FD in TAGs
  - Capture, formulate, deliver & refine program in terms of military needs/systems/capabilities
- Increase flexibility/cost effectiveness
  - Reduce No. of Thrusts & align with CGs
  - SAs & TLs in HQ - Most formulation functions
  - Lab & Section Heads - Most delivery functions

Systemic Changes

- Cohesive/Logical Planning/Approval/ Evaluation process:
  - R&D WGs - TAGs - OGs - RDPRC
- Maximize use of IT to improve client service
  - Develop user-centric MIS
  - Info. channels with clients - SHs on Banyan
  - Use modern Project Mgmt tools


Improving the R&D Process
Client Requirements
Cost-effective Program Formulation
Communications
Cost-effective Program Delivery
Integrated R&D to Production
Defence R&D Branch / Direction R et D pour la défense

Annex I: Working Group 6 Slides

Working Group 6

Implementing a Business Development Program

by

Mr. Neal Thomas

Issue Definition

- Objective is to set up a business development program
- Why:
  - to increase our resource base
  - need to maximize our budget
  - need to maintain/leverage capabilities
  - need to establish simple tools/ mechanisms to assist staff in implementing

Assumptions

- Outward looking
- There is a net benefit (ROI, consistency, exposure) to the establishment of the BDO
- DRDB's role and mandate will not change drastically
- Relationship with the Client will remain essentially constant

Assumptions (cont.)

- IP management will be within DRDB
- Revenue retention authority will be within DRDB

Discussion - Key Topics

- Organizational structure
- Authority and accountability; roles & responsibilities
- Resources - personnel & $
- Performance measurement
- Key Activities of the BDO

Discussion - Key Topics

- Key Activities of the BDO
  - Policy definition/development framework/guidelines
  - Activity coordination (reports, plans & activities)
  - Strategy definition
  - Marketing/sales/business plans
  - Corporate image
  - IP/DIR management

Discussion - Key Topics

- Key Activities of the BDO (cont)
  - Quality management and risk assessment
  - Networking
  - Advertising (internal & external)
  - Understanding and monitoring of S&T
  - Costing, planning, forecasting and assessing
  - Provision of advice/support to management & staff

RECOMMENDATIONS

- **ORGANIZATION STRUCTURE:**
  - **Corporate responsible for:**
    - **overall strategy, policy, corporate marketing, IP, DIR Program, coordination, corporate resources. Timeframe: short term. OPI: BD Implementation Plan Steering Committee (BDIPSC)**
  - **DREs responsible for:**
    - **support to local management, provision of advice & guidance to scientists, coordination of BD activities, liaise with corporate BDO. Timeframe: short term. OPI: DG/BDO**

RECOMMENDATIONS

- **KEY ACTIVITIES:**
  - **validate**
  - **split between corporate BDO and DRE BDO**

TIMEFRAME: varies depending on nature activity. From short to long term

OPI: varied. Coordination by Paul Pace, member of BDIPSC

RECOMMENDATIONS

- **MECHANISMS**
  - **accountability: to mirror existing expenditure authority**
  - **viability/exclusion: possible use of letters of interest (LOIs)**

Timeframe: short term. OPI: Technology Exploitation Group.

Long Term. OPI: BDO if/when changes are required

RECOMMENDATIONS

- **RESOURCES**

Personnel:

- **Corporate: one executive, one marketing officer plus DIR staff**
- **DRE: non-standard structure but minimum of one FTE at each DRE.**
- **Training: Federal Partners in Technology Transfer (FPTT) ??**

Timeframe: short term. DG. In progress

RECOMMENDATIONS

- MARKETING
  - internal and external
  - provide corporate resource: i.e., training, assistance, advice, coordination

Timeframe: medium / long term

OPI: all

RECOMMENDATIONS

- APPORTION REVENUE: corporate versus DRE
  - Stop potential imbalances
  - Must have costing standard
- Timeframe: short term
- OPI: proposals developed by BDIPSC and submitted to RDEC for approval

Systemic Changes

- IP management
- Competitive issue
- Approval process
- Culture shift
  - buy in/reward
  - recommend a review of policies of NRC, CRC & OGD's

Annex J: Results of Technology Leaders' Workshop Survey
19-21 October 1997

1. The Workshop met my expectations.

Yes 48 No 5

Comments

- no expectations (5)
- better than last workshop
- process for identifying issues was not effective
- well organized
- facilitators helpful to focus groups (2)
- a bit more process-oriented than expected
- could have used more time to discuss details (5)
- why need for consultants to sort out Branch affairs
- atmosphere that change is possible
- surprised at evolution that Section Heads believe is required
- CRAD and DGs should have stayed longer
- effective forum for communications
- low expectations but positive result
- regret issue of personnel, hiring, etc. not addressed
- still much to do
- would have preferred better "state of the nation"
- would have liked to propose other issues for discussion at Workshop
- good corporate approach to issues
- good way to meet peers (3)
- Working Group was unprepared for particular discussion (2)

2. I have a better understanding of the future direction of CRAD.

Yes 32 No 17

Comments:

- as much as the future can be seen right now (2)
- CRAD's opening and closing address candid and clear (5)
- felt good to be able to influence future of organization
- remains to be seen (2) - input made before and was ignored
- business metaphor becoming firmly entrenched
- waiting for ASD - briefing would have been helpful (2)
- better understanding of financial imperative to obtain outside funding
- especially regarding business office and revenue generation
- unclear on how much to invest on behalf of client and on other readily sellable technologies

- only thing clear is status quo is impossible
- nothing new was discussed (4)
- can now spend less time worrying about future and more on productivity
- future 'modus operandi' not synonymous with 'future direction'
- most Section Heads only see preservation and growth of their section as important
- better understanding but no confidence that anything can be done about future

3. The recommendations from the Working Groups are workable.

Yes 46 No 3

Comments:

- there must be explicit effort to make them work and follow up to ensure (3)
- they are realistic
- some are only interim fixes to long-promised solutions
- perhaps - but must shed baggage/civil servant attitudes
- some are contradictory
- recommendations must be championed at higher level (2)
- some require cultural change
- recommendations on serving the client better do not seem workable
- most are pragmatic enough to work
- must put recommendations in global context of ASD
- must remove impediments to action at all levels (2)
- not imaginative enough
- some discussion still required
- program formulation/priorities still not resolved
- not all issues properly addressed
- recommendations to further carve an already small budget will cause even smaller puts
- may be too much resistance from established factions both in and out of Branch
- too many good ideas are rejected by RDEC

4. The single most important thing to change in CRAD is:

Comments:

- to rein in DGs and get them to work as part of a team (2)
- continue to work towards total client satisfaction (6)
- realization that each employee at CRAD can contribute
- rebuild morale in Branch
- hiring procedures and retention (5)
- reward system (6) - let staff work for cash overtime, retain some IP royalties, receive merit increases and promotions
- the time required to change
- must become more of a corporate collective (5)

- culture (6)
- empowerment (2)
- focus on content over planning and process
- flexibility
- management training
- develop a long term vision and stick to it
- upper management responsiveness, action and feedback
- ensure we are not falling behind in technologies
- revenue retention without vote netting
- less committee debate and more decision-making
- the mission: CF requirements shorter statement; develop application of all R&D results useful for society
- attitude that change for the sake of change is the way ahead - "revolution is counter-productive"
- entrepreneurship
- lack of communication between labs and HQ
- ensure CRAD remains close to ADM(Mat) and CDS
- reduce part of management burden (depth of reporting, number of managers, etc.) (2)

5. The biggest barrier to change is:

Comments:

- lack of effort
- lack of resources (4)
- the established bureaucracy within CRAD (5)
- policies of other government departments (12)
- DND culture (3)
- culture of asking permission and seeking consensus
- turf battles b/w labs and b/w labs and HQ (3)
- geography
- ourselves (6) - 'need shared vision'
- inertia (2)
- personnel rewards system - (4)
- lack of management commitment (2)
- conflict of interest SA/DG, TL/SH
- management practices
- workload (2)
- difficult to terminate activities in order to start new ones
- Dept. attitude toward revenue generation
- lack of confidence
- the will to implement the vision
- motivation
- perception that we must act like the rest of gov't/DND
- lack of understanding of priorities
- no consensus on how resources should be allocated

- HQ out of touch with what goes on at labs
- cynicism
- lack of proper interaction with client during program formulation process

6. Ideas on how we can stay engaged in the evolution of CRAD

Comments

- keep up this process (17)
- distribute minutes from Workshop (2)
- exploit e-mail
- CRAD's visits to labs must really speak to change - can't be regarded as expounding motherhood (2)
- standard processes for managerial feedback (2)
- encourage people to communicate with one another
- CRAD too much of a democracy - Dr.Leggat should act on issues
- studies and reports circulated to DREs with multiple return paths (DGs, peers, etc.)
- Descartes
- delegated more tasks and decision-making to staff (2)
- seeking input from all employees
- establish group reward system that will enable real synergy
- ensure staff knows who is the client for all their actions
- identify performance indicators and measurements and review them regularly
- diffuse information through well-defined PPMS
- challenge people - show them your expectations
- follow through with recommendations (2)
- more site visits by RDEC
- groups of DSs from across the labs should meet annually
- Internet "workshops"
- involvement in implementation
- better training for managers